CLAIMS

1. A pseudo-fractal antenna comprising:

a dielectric; and,

a radiator proximate to the dielectric having an effective electrical length formed in a pseudo-fractal geometry.

2. The antenna of claim 1 wherein the radiator includes at least one section formed in a fractal geometry.

3. The antenna of claim 2 wherein the radiator includes at least one section formed in a non-fractal geometry.

4. The antenna of claim 3 wherein the radiator has an effective electrical length selected from the group including a half-wavelength and a quarter-wavelength of the antenna operating frequency.

5. The antenna of claim 4 wherein the antenna operating frequency selected from the group including approximately 1575 megahertz (MHz), approximately 850 MHz, and approximately 1920 MHz.

6. The antenna of claim 4 wherein the antenna is selected from the group including monopole and dipole antennas.

7. The antenna of claim 6 wherein the antenna is a monopole antenna; and,

the antenna further comprising:

a counterpoise; and,

wherein the dielectric is interposed between the counterpoise and the radiator.

8. The antenna of claim 7 wherein the radiator fractal geometry section is formed in a Koch curve.

9. The antenna of claim 6 where the antenna is a dipole antenna; and,

the antenna further including:

a counterpoise having an effective electrical length.

10. The antenna of claim 9 wherein the counterpoise has an effective electrical length formed in a pseudo-fractal geometry.

11. The antenna of claim 10 wherein the counterpoise includes at least one section formed in a fractal geometry.

12. The antenna of claim 11 wherein the radiator fractal geometry section is formed in a Koch curve; and,

wherein the counterpoise fractal geometry section is formed in a Koch curve.

13. The antenna of claim 9 wherein the counterpoise has an effective electrical length formed in a non-fractal geometry.

14. The antenna of claim 1 wherein the radiator is a conductor embedded in the dielectric.

15. The antenna of claim 1 wherein the dielectric is a dielectric layer; and,

wherein the radiator is a conductive line overlying the dielectric layer.

16. The antenna of claim 13 wherein the dielectric is a dielectric layer;

wherein the radiator is a conductive line overlying the dielectric layer; and,

wherein the counterpoise is a conductive line overlying the dielectric layer.

17. The antenna of claim 16 further comprising:

a balun antenna feed having a transmission line interface, a lead port connected to the radiator, and a lag port, 180 degrees out of phase at the antenna operating frequency with the lead port, connected to the counterpoise.

18. The antenna of claim 3 further comprising:

a transmission line interface; and,

wherein a radiator non-fractal geometry section is formed further from transmission line interface than the fractal geometry section.

19. The antenna of claim 3 further comprising:

a transmission line interface; and,

wherein a radiator non-fractal geometry section is formed closer to the transmission line interface than the fractal geometry section.

20. The antenna of claim 1 wherein the radiator pseudo-fractal geometry includes a Koch curve.

21. The antenna of claim 20 wherein the radiator pseudo-fractal geometry includes a second order iteration Koch curve.

22. A wireless communications device system comprising:

a wireless communication device receiver; and,

a pseudo-fractal antenna.

23. The system of claim 22 wherein the pseudo-fractal antenna includes:

a dielectric; and,

a radiator proximate to the dielectric having an effective electrical length formed in a pseudo-fractal geometry.

24. The system of claim 23 wherein the radiator includes at least one section formed in a fractal geometry.

25. The system of claim 24 wherein the radiator includes at least one section formed in a non-fractal geometry.

26. The system of claim 25 wherein the radiator has an effective electrical length selected from the group including a half-wavelength and a quarter-wavelength of the antenna operating frequency.

27. The system of claim 26 wherein the antenna operating frequency is approximately 1575 megahertz (MHz).

28. The system of claim 27 wherein the antenna is selected from the group including monopole and dipole antennas.

29. The system of claim 28 wherein the antenna is a monopole antenna; and,

the antenna further comprising:

a counterpoise; and,

wherein the dielectric is interposed between the counterpoise and the radiator.

30. The system of claim 29 wherein the radiator fractal geometry section is formed in a Koch curve.

31. The system of claim 28 where the antenna is a dipole antenna; and,

the antenna further including:

a counterpoise having an effective electrical length.

32. The system of claim 31 wherein the counterpoise has an effective electrical length formed in a pseudo-fractal geometry.

33. The system of claim 32 wherein the counterpoise includes at least one section formed in a fractal geometry.

34. The system of claim 33 wherein the radiator fractal geometry section is formed in a Koch curve; and,

wherein the counterpoise fractal geometry section is formed in a Koch curve.

35. The system of claim 31 wherein the counterpoise has an effective electrical length formed in a non-fractal geometry.

36. The system of claim 23 wherein the radiator is a conductor embedded in the dielectric.

37. The system of claim 23 wherein the dielectric is a dielectric layer; and,

wherein the radiator is a conductive line overlying the dielectric layer.

38. The antenna of claim 35 wherein the dielectric is a dielectric layer;

wherein the radiator is a conductive line overlying the dielectric layer; and,

wherein the counterpoise is a conductive line overlying the dielectric layer.

39. The system of claim 38 further comprising:

a balun antenna feed having a transmission line interface, a lead port connected to the radiator, and a lag port, 180 degrees out of phase at the antenna operating frequency with the lead port, connected to the counterpoise.

40. The system of claim 23 wherein the antenna includes a transmission line interface; and,

wherein the wireless communications device receiver is a global positioning satellite (GPS) receiver having a port connected to antenna transmission line interface.

41. The system of claim 25 wherein the antenna includes a transmission line interface; and,

wherein the wireless communications device receiver is a telephone transceiver having a port connected to antenna transmission line interface.

42. The system of claim 25 wherein the antenna includes a transmission line interface; and,

wherein a radiator non-fractal geometry section is formed further from the transmission line interface than the fractal geometry section.

43. The system of claim 25 wherein a radiator non-fractal geometry section is formed closer to the transmission line interface than the fractal geometry section.

44. The system of claim 22 wherein the radiator pseudo-fractal geometry includes a Koch curve.

45. The system of claim 44 wherein the radiator pseudo-fractal geometry includes a second order iteration Koch curve.

46. A pseudo-fractal dipole printed line antenna comprising:

a balun antenna feed having a transmission line interface, a lead port, and a lag port 180 degrees out of phase at the antenna operating frequency with the lead port;

a dielectric layer;

a radiator formed on the dielectric layer in a pseudo-fractal pattern and connected to the balun lead port; and,

a counterpoise formed on the dielectric layer in a pseudo-fractal pattern and connected to the balun lag port.

47. The pseudo-fractal antenna of claim 46 wherein the radiator includes a plurality of line sections with a least one line section formed in a fractal geometry; and,

wherein the counterpoise includes a plurality of line sections with a least one line section formed in a fractal geometry.

48. The pseudo-fractal antenna of claim 47 wherein the radiator fractal geometry line section is formed in a Koch curve; and,

wherein the counterpoise fractal geometry line section is formed in a Koch curve.

49. The pseudo-fractal antenna of claim 48 wherein the radiator has an effective electrical length of a quarter-wavelength of the antenna operating frequency; and,

wherein the counterpoise has an effective electrical length of a quarter-wavelength of the antenna operating frequency.

50. The pseudo-fractal antenna of claim 49 in which the antenna operating frequency is approximately 1.575 gigahertz (GHz).

51. The pseudo-fractal antenna of claim 48 wherein the dielectric layer is FR4 material having a thickness of 15 mils.

52. The pseudo-fractal antenna of claim 51 wherein the radiator is formed from half-ounce copper; and,

wherein the counterpoise is formed from half-ounce copper.

53. The pseudo-fractal antenna of claim 52 wherein the radiator is formed in lines having a width of approximately 30 mils; and,

wherein the counterpoise is formed in lines having a width of approximately 30 mils.

54. A method for forming a pseudo-fractal antenna, the method comprising:

forming a pseudo-fractal geometry conductive section; and,

using the pseudo-fractal geometry conductive section, forming a radiator having an effective electrical length.

55. The method of claim 54 further comprising:

electro-magnetically communication at an operating frequency responsive to the effective electrical length of the radiator.

56. The method of claim 54 wherein forming a pseudo-fractal geometry conductive section includes:

forming a fractal geometry conductive section; and,

forming a non-fractal geometry conductive section; and,

wherein forming a radiator having an effective electrical length includes creating an effective electrical length responsive to the combination of the fractal and non-fractal conductive sections.

57. The method of claim 56 wherein forming a radiator includes the radiator has an effective electrical length selected from the group including a quarter-wavelength and a half-wavelength of the antenna operating frequency.

58. The method of claim 57 wherein forming a radiator includes the radiator having an effective electrical length with respect to an operating frequency of approximately 1575 megahertz (MHz).

59. The method of claim 57 wherein forming a radiator includes forming an antenna selected from the group including monopole and dipole antennas.

60. The method of claim 59 wherein the antenna is a monopole antenna; and,

the method further comprising:

forming a counterpoise; and,

forming a dielectric interposed between the counterpoise and the radiator.

61. The method of claim 59 where the antenna is a dipole antenna; and,

the method further including:

forming a counterpoise using a fractal geometry conductive section and non-fractal geometry conductive section, the counterpoise having an effective electrical length responsive to the combination of the fractal and non-fractal conductive sections; and,

forming a dielectric interposed between the counterpoise and the radiator.

62. The method of claim 61 wherein forming a fractal geometry conductive section includes forming a Koch curve.

63. The method of claim 61 further comprising:

interfacing a transmission line to the antenna; and,

creating a 180 degree phase shift at the operating frequency between the radiator and the counterpoise.

64. A wireless communications system comprising:

a wireless telephone transceiver having a communications port; and,

a fractal antenna having a radiator, proximate to a dielectric, with an effective electrical length formed in a fractal geometry.

65. The antenna of claim 64 wherein the antenna includes the radiator being formed as a Koch curve.